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PATENT APPLICATION

METHOD FOR REMOTE VEHICLE IGNITION ENABLEMENT AND DISABLEMENT VIA BROADBAND ENABLED SECURITY MECHANISMS

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to vehicle enablement and disablement and, more particularly, to remotely controlling vehicle ignition enablement and disablement through various wireless technologies.

Description of the Related Art

Currently, there are a variety of systems that exist for vehicle protection. On Star® and LoJack® are examples of systems used to track stolen vehicles. Each of these two systems utilize a patch antenna on a vehicle to transmit and receive signals from a Global Positioning System (GPS) satellite. These services not only can provide detection of a location of a stolen vehicle, but can also allow for remote access to the vehicle if the keys are locked inside. Interactive theft deterrent systems, typically though, do not connect to the ignition system of a vehicle.

However, there are a variety of existing systems that indicate distress and/or vehicle disablement. In U.S. Patent No. 5,805,057 by Eslaminovin ("Eslaminovin"), which is hereby incorporated by reference, a vehicle can be disabled by a distress signal that is activated though a cellular phone. In

U.S. Patent No. 5,926,086 by Escareno et al. ("Escareno"), which is hereby incorporated by reference, a vehicle is disabled through the use of a pager that can also warn the driver. However, neither Eslaminovin nor Escaereno disclose the use of a wireless system to enable usage.

To date, there is no service available to remotely control a vehicle. Cars and other vehicles have elegant electronics merged with mechanical switches to operate as theft deterrents. However, these elegant electronic solutions integrated with mechanical switches typically are independent. In other words, the systems and vehicles operate independent of any external communication or other influence. Thus, the independence means that there is virtually no way to harmlessly stop the vehicle once it is taken or in motion. Invasive techniques, such as stop sticks that puncture tires, are utilized.

Because of the independence of the vehicle, a significant threat to the public is posed. There are times when thieves or owners may recklessly drive without stopping, even with police instruction. As mentioned, only invasive techniques are used to stop the vehicle. Invasive techniques, though, can cause harm to bystanders or property damage.

Therefore, there is a need for a method and/or apparatus for remotely controlling a vehicle ignition switch that addresses at least some of the problems associated with

conventional methods and apparatuses associated with conventional ignition systems and antitheft devices.

SUMMARY OF THE INVENTION

The present invention provides a method and computer program for remotely controlling vehicle ignition. At least one condition for disablement is received. Also, a vehicle ignition switch is disabled.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference is now made to the following descriptions taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a block diagram depicting the vehicle ignition computer; and

FIGURE 2 is a block diagram depicting the communication system for a vehicle.

DETAILED DESCRIPTION

In the following discussion, numerous specific details are set forth to provide a thorough understanding of the present invention. However, those skilled in the art will appreciate that the present invention can be practiced without such specific details. In other instances, well-known

elements have been illustrated in schematic or block diagram form in order not to obscure the present invention in unnecessary detail. Additionally, for the most part, details concerning network communications, electro-magnetic signaling techniques, and the like, have been omitted inasmuch as such details are not considered necessary to obtain a complete understanding of the present invention, and are considered to be within the understanding of persons of ordinary skill in the relevant art.

It is further noted that, unless indicated otherwise, all functions described herein can be performed in either hardware or software, or some combination thereof. In a preferred embodiment, however, the functions are performed by a processor such as a computer or an electronic data processor in accordance with code such as computer program code, software, and/or integrated circuits that are coded to perform such functions, unless indicated otherwise.

Referring to FIGURE 1 of the drawings, the reference numeral 100 generally designates a block diagram depicting the vehicle ignition computer. The ignition computer 100 comprises a GPS Transmitter/Receiver 110, a wireless transmitter/receiver 120, a processor 130, a manual ignition switch, an ignition switch 160, and a user defined usage 150.

There are two modes in which the ignition computer 100 operates: proactive and reactive. In a proactive mode, a user

or owner can define specific parameters under which the vehicle can operate, thus, allowing the user or owner to maintain overall control of the vehicle without the need to be physically with the vehicle. For example, if a parent is on out of town, the parent can remotely define a specific time and geographical area under which a child can operate the vehicle. In the case of the proactive mode, the ignition computer 100 utilizes a logical AND function. In other words, in terms of Boolean algebra, the user defined usage 150 and the manual ignition 140 must both be TRUE.

There are a variety of other functions that can be associated with proactive mode. The proactive mode can either be enabled or disabled based on user desire, geography, time of allowed usage and so forth. Example of a particular enablement or disablement are the so-called "safe zones" and "unsafe zones." An owner or user can predefine certain geographical regions in which there the manual ignition switch would function without the need for a predefined usage. In other words, a key would turn the engine over in a safe zone. However, the processor can also be equipped to effectively be trained and to learn where safe and unsafe zones are located based on history. The processor 130 can crosscheck and historically compare the GPS-provided coordinates, the alarm system, and any other sensors that the car is equipped with to detected any potentially harmful scenarios. Essentially the

computer can "learn" what zones are safe zones and anticipate potential unsafe zones.

Also, in the proactive mode there are a variety of other features that can be realized. No attempt to re-enable the vehicle using the manual ignition switch 140 can cause the processor to reactivate the ignition system 160. Also, the owner of the vehicle can 'check up' on the vehicle by utilizing one of the wireless/broadband access technologies that utilize the wireless transmitter/receiver 120. To accomplish this, the owner calls the vehicle and authenticates using a private key. Once authenticated, the owner contacts the vehicle and asks for status. For example, if the vehicle processor is configured to utilize a cellular network, the owner can "dial" the vehicle. The vehicle can reply with a variety of responses, such as a longitude and latitude.

In the reactive mode, the operation of the processor enabling the ignition switch is quite different. A "disable" signal is sent securely over one of the transport mediums to the vehicle, such as a satellite uplink. The vehicle can be stopped when it is safe to do so and allows for either silent mode disabling, where the driver of the vehicle is not notified, or non-silent where a warning message can be communicated to the driver of the impending stop. Law enforcement can have a database linking license plates, car Vehicle Identification Numbers (VINs), and so forth for an

embedded code needed to send to the vehicle to make it stop. That way, any law enforcement vehicle can stop a vehicle fitted with a disablement system. Conversely, the database could proactively notify a law enforcement vehicle when in proximity of the suspect VIN number via message broadcast to the law enforcement vehicle.

However, in order for the ignition computer to operate, a variety of connection should be made. The processor 130 is coupled to the GPS transmitter/receiver 110 through a first communication channel 102. The processor 130 is also coupled to the wireless transmitter/receiver 120 through a second communications channel 104. Also, the processor 130 is coupled to the manual ignition switch through a third communication channel 106. The processor is also coupled to the ignition system 160 through a fourth communication channel 112. The user 150 is coupled to the wireless transmitter/receiver 120 through a first wireless communication channel 208. Moreover, any of the aforementioned communication channels would encompass wireless links, optical links, conductor cable links, packet switched channels, direct communication channels, and any combination thereof.

Referring to FIGURE 2 of the drawings, the reference numeral 200 generally designates the communication system for a vehicle. The communication system 200 comprises a vehicle 214, a wireless phone interface 208, a pager interface 206, a

satellite interface 210, a radio/microwave interface 212, a computer network 204, and an owner/user 202. There are a variety of remote communications that can take place between an owner/user 102 and a vehicle. For example, in a proactive model, an owner/user 102 can remotely enable as described in FIGURE 1.

However, in order for any remote communication to exist between an owner/user 202 and a vehicle there are a variety of connections that could be established. The user/owner 202 is coupled to the computer network 204 through a fifth communication channel 220. The computer network 204 is coupled to the wireless phone interface 208 through a sixth communication channel 222. The computer network 204 is also connected to the pager interface 206 through a seventh communication channel 224. The computer network 204 is also coupled to the other wireless interface 216 through an eighth communication channel 226. The computer network 204 is also coupled to the satellite interface 110 through a ninth communication channel 228. The computer network 204 is also coupled to the Radio/microwave interface 212 through a tenth communication channel 230. The wireless phone interface 208 is coupled to the vehicle 214 through an eleventh communication channel 232. The pager interface 206 is coupled to the vehicle 214 through a twelfth communication channel 234. The other wireless interface 216 is coupled to the

vehicle 214 through a thirteenth communication channel 236. The satellite interface 210 is coupled to the vehicle 214 through a fourteenth communication channel 238. The radio/microwave interface 212 is coupled to the vehicle 214 through a fifteenth communication channel 240. There can be a single communication channel or multiple communication channels, as shown in FIGURE 2, to the vehicle 214. Also the computer network can be any type of computer including, but not limited to, the Internet. Moreover, any of the aforementioned communication channels would encompass wireless links, optical links, conductor cable links, packet switched channels, direct communication channels, and any combination thereof.

It will further be understood from the foregoing description that various modifications and changes may be made in the preferred embodiment of the present invention without departing from its true spirit. This description is intended for purposes of illustration only and should not be construed in a limiting sense. The scope of this invention should be limited only by the language of the following claims.